ECE210-B - MATLAB Seminar, Spring 2026

The Cooper Union for the Advancement of Art and Science

Albert Nerken School of Engineering

Course Information

- **Meeting Time/Place:** Mondays 4:00 pm - 5:00 pm, Room 802
- **Credits:** 0
- **Instructor:** Jason Hao
- **Email:** jason.hao@cooper.edu
- **Office Hours:** Upon request
- **Course Website:** `https://github.com/jhao23/ECE210`

Course Overview

A weekly hands-on, interactive seminar that introduces students to MATLAB, in general, and the Signal Processing Toolbox in particular. Students explore scientific computation and scientific visualization with MATLAB. Concepts of signal processing and system analysis that are presented in ECE211 or other introductory courses on the subject are reinforced through a variety of demonstrations and exercises. It is strongly encouraged for students taking a first course in signals and systems, or for students expecting to use MATLAB in projects or courses.

Prerequisite: MA 113

Recommended co-requisite: ECE 211 or equivalent

Short version: we are basically just learning how to use MATLAB for signal processing.

Prerequisite Skills

Although the only prerequisite is technically Calculus II, we will make use of linear algebra and other concepts from your core math and programming courses (the language is called MATrix LABoratory for a reason). Throughout the course, we will deal with topics such as matrices, calculus, complex numbers, basic probability, and numerical representation. If you are uncomfortable with any of these topics, please review them so that you can follow along with the course easier.

Course Goals

The main purpose of this course is to give you a base of MATLAB to carry out routine calculations that every EE should know for signal processing. By the end of this course, you should be able to

- Write clean and effective MATLAB code.
- Vectorize calculations to carry out calculations efficiently.
- Plot and visualize various kinds of data using MATLAB.
- Take into account numerical issues like roundoff error and precision.
- Work comfortably within the s, z, and frequency domains.
- Design analog and digital filters for signal processing.

This course will also achieve the following ABET outcomes:

- 1. An ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics.
- 6. An ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions.
- 7. An ability to acquire and apply new knowledge as needed, using appropriate learning strategies.

Course Policies

Attendance is expected every week as I will usually go over more material than what the lecture notes provide. If you cannot make a class, you do not need to contact me, but I will check in with you if you miss many classes.

The homework (and the course as a whole) is graded on a pass/fail basis. There will be six core homework assignments and several (about 2-4) additional assignments. Passing the course requires six passing homework assignments.

Each assignment will be due the week after it is assigned by the start of class. Resubmissions and late homework submissions are not accepted and will not be graded. If you need an extension on a homework, contact me via email or Teams. I will also not grade any submissions that do not meet the submission guidelines posted on the website.

All submissions for homework assignments should be emailed to me as a pdf of the code (using the publish command in MATLAB). You may also send the .m file along with the pdf if you would like. The code will be graded based on completeness, accuracy, and formatting with some feedback given on the returned homework.

The lecture notes, homework, and course materials can be found at the github link above. If there are any major changes to any pertinent documents/homework on the github, I will notify you as soon as possible.

Generative AI is not prohibited, but heavily discouraged (this is literally a 0 credit class) as LLMs can often produce inefficient or incorrect code, especially for MATLAB. If you receive help from an LLM or someone else/the internet, cite where the code came from and review/modify the code as needed. The goal of the course is to get comfortable with using MATLAB for EE applications, so I would rather you learn MATLAB instead of blindly copying code. As a reminder, Cooper's academic regulations can be found at `https://cooper.edu/engineering/curriculum/academic-standards-regulations`.

Student Resources

Title IX Policy: `https://cooper.edu/sites/default/files/uploads/assets/site/files/2020/Cooper-Union-Policy-Upholding-Human-Rights-Title-IX-Protections.pdf`

Accommodations: `https://cooper.edu/students/student-affairs/disability`

Counseling/Mental Health: `https://cooper.edu/students/student-affairs/health/counseling`